

Party Submissions

From: New York State Parks and Recreation,
Shoreline Cruises, Scarano Boatworks, Cummins
Mercruiser, Hypro Pumps

(31) pages total including this cover

New York State Parks, Recreation and Historic Preservation

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Date: 6/9/2006

Re:

CC:

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Attached is our party submission.



Bernadette Castro
Commissioner

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June 8, 2006

Morgan Turrell
National Transportation Safety Board
Office of Marine Safety
490 L'Enfant Plaza East, SW
Washington, DC 20594-2000

Dear Mr. Turrell:

The New York State Office of Parks, Recreation, and Historic Preservation hereby provide the Agency's party submission to the Board as a result of our participation in the Board's inquiry into the Ethan Allen accident upon the waters of Lake George, New York, on October 2nd, 2005.

Proposed Findings

- The vessel which was renamed Ethan Allen entered New York State sole-state waters in 1979 with a valid, unexpired Certificate of Inspection issued by the United States Coast Guard, establishing a maximum loading capacity of 48 passengers, 1 vessel operator, and 1 crew member.
- The United States Coast Guard is the recognized authority on vessel inspection and stability, having developed and set the standards and methods used to determine vessel stability and passenger capacity. As such, it is and was Industry Standard for State inspectors to accept existing capacity ratings demonstrated by validly issued USCG Certificates of Inspection.
- The factual record indicates that at least one and quite probably two different canopies were added to the original hull after the vessel entered service in federal waters off Connecticut, but does not document that any additional stability testing was performed as a result of those modifications. The canopies utilized on the vessel in Connecticut were either aluminum or steel and canvas combinations.
- The evidence demonstrates that, with a canopy of any combination of canvas and either steel or aluminum, the vessel did not meet minimum stability criteria for any passengers, and was, in fact, carrying an erroneous capacity rating for 48 passengers upon her entry into NYS waters.

- In 1989 the metal/canvas canopy was replaced with one made of red cedar wood and Plexiglas, crafted and installed by Scarano Brothers boat builders of Albany. The 1989 canopy lowered the vessel's wind heel, and thereby increased its stability making the vessel safer than it had been when it arrived in NYS Waters a decade earlier.
- The Record demonstrates that the *Ethan Allen*, after dipping into the cove south of Cramer Point began a turn to the right (starboard) when the vessel was overtaken on the right rear corner (starboard quarter) by a wake or wave allegedly created by the passage of another vessel operating upon the lake.
- The *Ethan Allen*, engaged in a turn to the right (starboard), would have naturally heeled to the left (port) as a function of its hull design. In this condition the *Ethan Allen* would have been more tender and susceptible to further heel to port due to other factors such as passenger distribution and/or wave action.
- The seating configuration of the *Ethan Allen* was three (3) person benches mounted perpendicular to the port side gunwale, and two passenger benches mounted perpendicular to the starboard side gunwale, thus placing a disproportionate amount of the passenger weight to the left of the vessel's centerline.
- The standard tour in this section of the lake identifies several homes along the western shoreline, passengers would naturally have been looking towards the shoreline on the port side and possibly leaning in that direction. As the right turn began the *Ethan Allen* rolled to port further shifting the balance of the vessel towards the port side.
- When the *Ethan Allen* was overtaken by the wave or wake on the starboard quarter (right rear corner) the effect of this wave or wake would have been to rapidly raise the right rear corner of the vessel causing the *Ethan Allen* to roll further to the left (port) in a bow down attitude. This rapid roll to the left caused several of the passengers seated on the right (starboard) side of the vessel to slide from their seats towards the already more heavily loaded left (port) side of the vessel further increasing the instability of the *Ethan Allen*.

Probable Cause

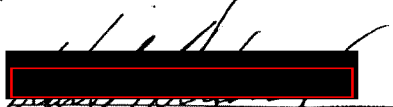
The vessel that became the *Ethan Allen* arrived in New York State with an erroneous capacity rating that was based on incomplete stability test data, resulting in a vessel that could not pass established safe passenger loading standards for 48 passengers it was rated to carry. Subsequent modifications to the vessel's canopy have been determined to have increased overall stability, resulting in a greater passenger capacity, but not to the established rating as specified in the original certificate of inspection.

On October 2, 2005, during its second tour of the day, the vessel was carrying 48 passengers, based on this erroneous rating, and faced a unique combination of factors identified above. Unable to recover from the combination of the natural roll to the left initiated by the turn to the right, coupled with the unequal passenger loading due to the seating configuration, the rapid roll further to the left induced by the wave or wake striking the vessel on the right rear (starboard quarter), and the shifting of the passengers on the right (starboard) side of the vessel towards the port side, the vessel heeled to port and capsized, later sinking.

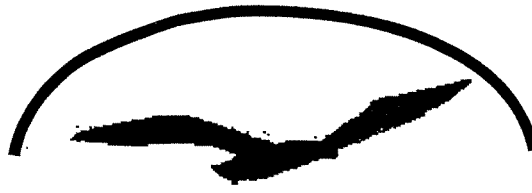
New York State Response and Proposed Recommendations

- NYS OPRHP has responded to information gathered during the course of this investigation by requiring, that any time a public vessel is modified in any way that potentially impacts vessel stability, the owner must provide recertification as to stability and capacity provided by a naval architect, or qualified engineer. In addition, OPRHP proposes to require such recertification of all public vessels at intervals of not more than ten years regardless of changes or modifications made to the vessel.
- OPRHP has also undertaken and completed a review of stability data for all vessels under its jurisdiction and retested any vessel for which data was found to be in question.
- In cases where vessels have entered NYS sole state waters carrying USGC issued certificates of inspection, OPRHP has reexamined stability information upon which such COI's were based, and has required owners to submit to new stability testing where sister ship information was utilized, or where existing stability data were otherwise incomplete.
- When conducting these new stability tests, the state used the NTSB recommended passenger weight of 174 pounds rather than the previous established 140 pounds when calculating the average weight of men, women and children.


[Redacted Signature]
Brian Kempf
Sr. Marine Service Representative


[Redacted Signature]
Walter Schedel
Sergeant Park Police

REC'D JUN 09 2006



SHORELINE

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June 8, 2006

SENT VIA OVERNIGHT MAIL

Mark Rosenker, Acting Chairman
National Transportation Safety Board
490 L'Efant Plaza, SW
Washington, DC 20594

ATTN: Capt. Morgan Turrell, IIC

Re: October 2, 2005 Capsizing and Sinking of the
New York State Public Vessel *Ethan Allen* (DCA06MM001)

Dear Chairman Rosenker:

Enclosed please find six copies of the Party Submission of Shoreline Cruise, Inc. regarding the accident involving the vessel *Ethan Allen* on Lake George, New York on October 2, 2005. This submission has also been forwarded electronically in PDF format. Please also provide us with copies of any submissions received from any of the other parties.

Thank you for your consideration of this matter.

Very truly yours,

SHORELINE CRUISE, INC


Sean Quirk, President

Enclosures

Party Submission of Shoreline Cruise, Inc.

To The

National Transportation Safety Board

Regarding The Accident Involving

**The Vessel *Ethan Allen* on Lake George,
New York**

On October 2, 2005

Introduction

On October 2, 2005, a tragedy occurred on Lake George, New York, when a passenger vessel, the *Ethan Allen*, capsized in the lake, resulting in the death of 20 tourists from Michigan and reportedly injuring others. Immediately after the incident, the Warren County, New York, Sheriff's Department and the National Transportation Safety Board (NTSB) initiated an extensive investigation into the cause of the mishap. Inasmuch as Shoreline Cruise, Inc. does not have the resources to conduct a parallel investigation alongside these two agencies, Shoreline is relying primarily upon the investigative work conducted by these two agencies, as well as statements made to various news publications, for its analysis and conclusions. Nevertheless, Shoreline submits these proposed findings in an effort to assist the Board in its effort to reach a probable cause determination upon the likely reason for this unfortunate incident.

Factual Information

Shoreline Cruise, Inc. Shoreline Cruise, Inc. is a closely held corporation, whose stock is held entirely by Quirk's Marine Rentals, Inc. The sole shareholder of Quirk's Marine Rentals, Inc. is James Quirk, who has lived and worked in the Lake George area for almost 30 years. The business is a family owned and run business with Sean Quirk serving as the president of the company. Virginia Quirk, wife of James and mother of Sean, serves as the company's treasurer, and is also responsible for administration and human resources. Also involved in the company is Hugh Quirk, James Quirk's brother, and Matthew Quirk, another son of James and Virginia, who is responsible, along with James Quirk, for waterfront operations.

The business, which runs tour boats on Lake George from its dock in the Southwestern shore of Lake George, operates with three smaller boats: the *Ethan Allen*, the *deChamplain* and the *Algonquin*. Additionally, the operation provides both tour services, as well as social functions, on its two larger boats, the *Horicon* and the *Adirondac*. The business has been in operation since 1979, when it purchased the smaller boats, and has never encountered a circumstance similar to the event of October 2, 2005. The company has never been cited with any safety violations from the New York State Office of Parks and Recreation, or the Lake George Park Commission, both of which have jurisdiction over boating matters on Lake George.

Richard Paris. Richard Paris was the senior master of the vessel, *Ethan Allen*, at the time that the boat capsized. Paris, age 74 at the time of this incident, is a former New York State trooper, having retired in 1982. During that period of time, he served on the Lake George Marine Patrol, and had operated a state police boat on the lake. He obtained his New York State Master's License in 1984. Since then, he has piloted all of the vessels belonging to Shoreline, and has piloted the *Ethan Allen* and its sister ship, the *deChamplain* at least 5000 times, all without incident. His license, which has authorized him to pilot public vessels in the state of New York, does not expire until June of 2006. Other than a stint in the Army, Paris has lived in upstate New York all of his life and has piloted boats on Lake George since he was 15 years old. His driver's license has never been suspended for any reason, nor has he ever been disciplined by Shoreline in his 23 years of service to the company.

The Ethan Allen. The vessel at issue in this matter, the *Ethan Allen*, is a vessel of 38 feet LOA with a 12 foot beam and is of fiberglass construction. According to the investigation conducted by the NTSB, the vessel was constructed in 1964 by the Anchorage Shipyard of Warren, Rhode Island, which was commissioned to build the vessel by Whaling City Dredge and Dock Corporation of Groton, Connecticut. The boat was named, at that time, the *Double Dolphin*. This boat went into service in 1965 and, shortly thereafter, two more boats were commissioned by Whaling City Dredge and Dock to be built by the Anchorage Shipyard. Those boats, originally named the *Sea Horse* and the *Sea Lyon*, eventually became the *de Champlain* and the *Algonquin*, when the fleet of three vessels was purchased in May of 1979 by Shoreline.

In the mid 1960's, these vessels were all inspected and certified by the United States Coast Guard, OCMI, Providence, Rhode Island. According to the NTSB investigation, the Coast Guard may have administered a stability test pursuant to 46 CFR § 179.10, Stability Test Procedure, which was the standard at that time. In fact, a certificate of inspection ("COI") issued by the Coast Guard in 1976 references a stability letter (which has not been located) dated May 27, 1966. When the boats were purchased in 1979 by Shoreline, they were no longer going to be operating on waters within the Coast Guard's jurisdiction. New York State, therefore, which now had jurisdiction over these vessels, accepted the original Coast Guard certificate of inspection, referring to the stability test. New York, however, did not require a new stability test either when the vessel was put into operation in the waters of New York or after the canopy top was replaced on the boat in 1989, when Shoreline hired Scarano Brothers Boat Builders, in Albany, New York, to replace the canvas canopy on the vessels with an all-wood, enclosed structure with Plexiglas windows.

Since being purchased in 1979 and subsequent to the replacement of the canopy top on the vessel in 1989, neither the *Ethan Allen*, nor any of the sister ships experienced any issues or any difficulty whatsoever with their balance. Never in the history of the company has there been a "near miss" or any other incident in which a Shoreline vessel has ever almost capsized. The company has taken thousands of voyages on Lake George, prior to this day, without ever experiencing a similar type of incident. Moreover, a significant percentage of these trips were conducted with the boat at its full capacity of 48 passengers. The boat had passed inspection, every year, and had been certified by New York State in May of 2005 for another year of operation (See attached Exhibit "A"). In fact, Shoreline has operated the *Ethan Allen* since 1979 in substantially the same configuration, with similar or slightly greater loads, without ever experiencing any balance or handling issues of any kind prior to the October 2, 2005 accident.

The Incident of October 2, 2005. October 2, 2005 was a calm, clear day, with the temperature (according to readings by the National Weather Service from Floyd Bennett Memorial Airport in Glens Falls, New York) hovering around 71 degrees (with the water temperature at approximately 68 degrees). That morning, Master Paris arrived at the Shoreline dock at approximately 10:00 a.m., in preparation for his first cruise of the day, which was at 10:30 a.m. He checked the engine and the transmission system, including the fluids and oils, and made sure that there was no leakage of water in the bilge or other compartments. He then took his first cruise on the *Ethan Allen* at 10:30 a.m., which lasted until 11:30 a.m.. He piloted one more cruise on the boat before the incident in question. Additionally, Hugh Quirk, the brother of James Quirk, also piloted one cruise out on the *Ethan Allen* that morning. All of these cruises were entirely without incident.

At approximately 2:20 p.m., two tour buses from Michigan arrived at the dock. The tour had been booked by Shoreline Charters and Tours, a Canadian company entirely unaffiliated with Shoreline Cruise, Inc. (the name similarity is purely a coincidence). Since the *Ethan Allen* was certified for 48 passengers, Shoreline allowed 47 of the tourists, mostly senior citizens from Michigan and the surrounding area, to board the boat. Hugh Quirk was also going to board, but the tour guide, Carol Charlton, from Shoreline Charters and Tours, informed Hugh Quirk that she would be boarding the boat to take care of her passengers while they were on the boat. Quirk asked Paris if this was satisfactory to Paris, and Paris replied affirmatively. The remainder of the passengers from the tour, arriving later, boarded the *deChamplain*.

Pursuant to New York State Regulations, the proper number of personal flotation devices were located in a clearly marked storage area, available for emergency use. At approximately 2:30 p.m., the *Ethan Allen* departed the dock and started heading north along the west side of Lake George between Tea Island and the shore. The master remained on a northerly course toward the historic mansions and Hearst State Park. During this trip, Paris did not notice anything unusual about the boat, or its handling, and, as most of the surviving passengers noted, the boat proceeded slowly along calm waters. As was Paris' normal routine, he described, over the vessel's public address system, the various sites of interest on the western shore of Lake George.

As the *Ethan Allen* approached Cramer Point, it was overtaken by a much larger passenger tour vessel, the *Mohican*, which was traveling at a greater rate of speed.¹ The *Mohican* failed to provide any signal or warning to the *Ethan Allen* that it was about to be passed.² Continuing his standard narrative of the interesting points on the lake's shoreline, Paris, piloting the smaller *Ethan Allen*, began to approach the shore area, which was consistent with the boat's normal route. As he turned the wheel of the vessel a half to three quarters of a rotation to the right, as he had done thousands of times before, to turn out of Cramer Point, three wakes slammed into the stern on the starboard side of the vessel. The wakes traveled the entire starboard side, and Paris, an experienced senior master, was unable to steer out of them. When the wakes violently struck the vessel, some of the passengers were thrown from their seats to the port side of the vessel³. At that time, the vessel overturned and inverted on the port side. The boat then capsized and was quickly submerged, leaving no time whatsoever for any of the passengers to even attempt to retrieve the personal flotation devices.

¹ One witness, John C. Montana, who saw the *Mohican* shortly after the *Ethan Allen* capsized, stated that the *Mohican* appeared to be traveling faster than usual. See the Warren County Sheriff's Office ("WCSO") Report.

² Under New York navigational rules, when one vessel overtakes another, the overtaking vessel must keep clear of the vessel it is overtaking. See *New York State Boater's Guide*, State of New York, Office of Parks, Recreation and Historic Preservation, Bureau of Marine and Recreational Vehicles, at page 32 (2004). It should also sound its intentions to the overtaken vessel, see N.Y. Nav. Law § 41 Pilot Rules (when vessels are running in the same direction, the master of the overtaking vessel must signal the vessel to be overtaken by giving one distinct blast of the vessel's whistle if she wishes to pass to starboard and two distinct blasts if she wishes to pass to port, which signals are then returned by the overtaken boat), and is responsible for any damage caused by its wake. See *New York State Boater's Guide*, p. 38.

³ Contrary to rumor at the time, all seats were permanently fixed to the boat deck and seats did not slide along the deck.

Many of the passengers swam out through the open windows of the capsized vessel and clung to the overturned boat.⁴ Local pleasure boaters quickly responded to the accident, throwing any floatation device available to the people in the water. These individuals did all that they could to haul the passengers out of the water and into their vessels. Others called 911 on their cell phones immediately, resulting in the rapid response by local law enforcement in their service vessels. The Lake George Fire Department was notified by 911 of the mishap at 2:56 p.m., approximately two minutes after the first calls took place, and also responded to the accident site. Responders from the Lake George Park Commission, ambulances, and fire department vessels all arrived to assist as well. All in all, approximately 49 emergency response vessels and vehicles responded to the scene and established command centers.

A scuba diving school, practicing nearby, also viewed the incident, at least partially. They waited for vessels to take them to the accident scene. There, they rendered assistance in the form of retrieving those unfortunate passengers who were unable to survive. Twenty people died in the accident and, according to the NTSB investigation, eighteen passengers and the master were reported as suffering no injuries, while six people were reported as suffering minor injuries and three suffering more serious injuries. These people were transported to Glens Falls Hospital by ambulance, where some were released within two to three hours, and others were released after a few days of treatment.

The Investigation

Immediately, local law enforcement, led by Sheriff Larry Cleveland of the Warren County Sheriff's Department, launched its investigation. The Sheriff himself jumped into a patrol boat, and arrived on the scene at approximately 3:30 p.m. According to the Sheriff's report, the vessel plunged to the bottom of the lake approximately 15 minutes later. At approximately 3:50 p.m., James Quirk, in a pontoon boat, approached the Sheriff with Master Paris, who was cold, shaking, and visibly upset. Sheriff Cleveland immediately took an informal statement from the master, and noted that Paris exhibited absolutely no indication of alcohol consumption. Paris informed Cleveland that the boat overturned when it was struck by the wakes of another boat on the lake: the *Mohican*, and neither he nor the passengers had time to either react or don life preservers. Cleveland instructed Quirk to bring the master to shore, where he could meet with another investigator and provide a written statement. At that time, Paris wrote as follows: "I departed at approximately 2:40 p.m. I went north on the west side of the lake across to Cramer Point. I started to swing the bow of the boat to the right and immediately encountered stray waves from the wake that was produced by the *Mohican*, that was going northbound. As soon as the boat encountered the first wave, the wave caught the boat on the right side (starboard side) of the boat. The wave hit the boat more towards the stern. The entire boat then tipped to the left and just kept right on going. The boat tipped completely upside down. I got out and hung onto

⁴ All of the windows of the *Ethan Allen* were fully open and remained in the open position at the time of the accident, as was confirmed when the windows were still open when the boat was retrieved on October 3.

the boat. It happened so quickly none of the passengers had the opportunity to put on life preservers.”

In addition to the written statement provided by the master, the Sheriff’s Department promptly also began interviewing and obtaining oral and written statements from the surviving passengers, other boaters on the lake, and observers on the shore. Many gave varying accounts of the incident. All agreed that the weather was clear and calm.⁵ Some of the passengers recalled seeing a “wake,” a “wave,” or a “swell.”⁶ One recalled that the boat rocked back and forth violently while the master was “frantically” turning the wheel.⁷ Some recalled a speed boat in the area and thought that the master was turning into the wakes caused by the speedboat.⁸ Some did not recall seeing a wake of another boat at all, and had no idea what caused the boat to capsize.⁹

Some of the boaters on the lake recalled the wakes and the speed of the *Mohican* to be particularly high at that time. One thought that the *Mohican* was far from the accident site, and others did not notice any wakes or wave hitting the *Ethan Allen* before it went over. One boater in particular, however, remembered that, as he was approximately a half mile north of Cramer Point and piloting his boat in a southbound direction, the *Mohican* passed him going northwards. He recalled that the *Mohican* was traveling at a high rate of speed, and producing 5 ½ to 6 foot waves. He slowed down, and the bow of his boat still dove hard into the wakes. As he resumed his speed, he approached Cramer Point approximately two or three minutes later, and encountered the accident scene involving the *Ethan Allen*. His wife, who was also interviewed by the Sheriff’s department, had a recollection of the events that was consistent with that of her husband.¹⁰

The Sheriff’s Department also interviewed the owners and operators of the *Mohican*, owned by Lake George Steamboat Company, Inc., as well as both present and former employees of Shoreline Cruise, Inc. A variety of other individuals, all with various experiences on the lake relating to both the *Ethan Allen* and the *Mohican*, also contributed statements. The team of law enforcement officers interviewed present and former captains of the *Ethan Allen*, as well as mechanics, and apparently came to the conclusion that there was no deficiency in either the repair history of the vessel or any previous incidents involving this vessel or any other owned by

⁵ One resident of Lake George and a boater on the lake for 35 years stated that it was “unusually quiet.” See statement of James Davies, WCSO report.

⁶ Passenger Anna Hawley stated that she saw the “wake” coming and said “we’re going to rock and roll” before the boat tipped over. Passenger Dorothy Riley said that the boat tipped over after it hit a “swell.” See WCSO report. Jean Silver, another passenger, told the Detroit News that she “remembers standing up in the front of the boat before a wave hit. The boat lurched and she landed in the water.” The *Detroit News*, Oct. 4, 2005.

⁷ See statement of passenger Eunice Stevens. WCSO report. Year-round resident Dorothy Warren stated that one survivor told her “she saw a big boat coming close and she said ‘Whoop-dee-do. I love a rocking boat.’” See *Maritime Digital Archive* (Oct. 3, 2005).

⁸ See statement of Lawrence Mahalak. WCSO report.

⁹ See statements of Brian and Eric Hart. WCSO report.

¹⁰ See statements of John and Angela Montana, WCSO report. See also footnote 22 below.

Shoreline Cruise that proved similar in any respect to this incident. The investigators also interviewed John Scarano of Scarano Boat Builders, Inc. and learned about the installation of the canopy top in 1989.

Additionally, the Sheriff's Department identified and located certain photographs and video evidence taken both from passengers aboard the *Mohican*, as well as a news camera (Channel 9 News) on top of the Shoreline Restaurant. Those photographs and video demonstrate that at 2:39 p.m. the *Mohican* departed its dock at the Lake George Steamboat Company,¹¹ after the *Ethan Allen* left the Shoreline dock at approximately 2:30 p.m. Both vessels headed in a northerly direction with the *Mohican* following the *Ethan Allen* on the west side of the lake. Steve Gibbons, a passenger on the *Mohican*, took several photographs from the deck of that boat. From the time stamped on the photographs, identifying images on the shore, it can be calculated that the *Mohican* was traveling at approximately 19.275 miles per hour (see Exhibit "B"). Based upon the time and distances recorded from the photographs, this would have resulted in the *Mohican* overtaking the *Ethan Allen* right approximately at Cramer Point, the site of the accident. Moreover, despite representations from the principal of the company that owns the *Mohican*, reported in press after the accident, that the *Mohican* was far from the site of the capsizing,¹² the photographs taken by Gibbons clearly show the *Ethan Allen* in close proximity to the *Mohican*, in a position of being overtaken by the larger boat, as they both traveled in a northerly direction.

The day following the incident, October 3, 2005, the *Ethan Allen* was raised from the depths of Lake George, drained, and transported to the Floyd Bennett Memorial Airport in Queensbury. There, the boat was thoroughly inspected for mechanical failures, including the water filters, raw water pump, heat exchanger, and exhaust system, as well as for any breach of the thru hull. None were found, and the only damage found was determined to be caused by the sinking of the vessel itself. Through an inspection of the interior of the hull, the investigators learned that twenty one lead bricks had been placed around the fuel unit, as ballast, to greater enhance the stability of the boat. On October 5, the boat was towed from the airport hangar to Adirondack Boat Carriers in preparation for a water test, which was conducted at the Shoreline Cruise facility on October 6. The hull of the vessel was tested for leaks, and none were discovered. The boat was then towed to the Village of Lake George Wastewater Management facility, where it was stored. Several days later, on October 10, after the vessel had been left unguarded for all that time, a very small gap was located between the flange and the main engine raw water pump housing. As discussed below, this initiated detailed testing of the water pump to determine if, in fact, this small gap contributed in any way to the incident. Nevertheless, at this time, there is nothing to suggest that this gap had anything to do with the capsizing of the boat, much less its operation.

On Wednesday, October 5, 2005, a stability test was conducted at Hall's boat yard on the *Ethan Allen*'s sister vessel, the *deChamplain*. The purpose of the test was to assess the vessel's ability

¹¹ The *Mohican*'s scheduled departure time was 2:30 p.m., but it was apparently running approximately ten minutes late.

¹² According to a report in the *Albany Times Union* (Oct. 11, 2005), Bill Dow, who owns the *Mohican* and its parent company, said that the *Mohican* was on the lake that day but at least a mile away when the *Ethan Allen* sank. According to Dow, "The *Mohican* was nowhere near."

to maintain a designated level of freeboard under certain conditions, centered around wind heeling moment and passenger heeling moment. Twelve sixty gallon drums were filled with water and placed in the middle of the vessel (apparently, according to the NTSB factual report, this was to approximate the passenger weight of the 48 people on board the *Ethan Allen* when it capsized). After the barrels were then emptied, they were shifted to the port side of the vessel, and refilled. After the third barrel was filled, the test was aborted, purportedly because the boat started tipping to within three inches of the immersion mark, for a moment of 7164 foot pounds. The investigators terminated the test, citing safety concerns. The investigators then performed an inclining experiment with the water barrels and recorded the data. Following this, both the *deChamplain* and the *Ethan Allen* were weighed on a New York State certified truck scale. It was determined that the *deChamplain* weighed 14,850 pounds and the *Ethan Allen* weighed 15,300 pounds.

On December 20, 2005, NTSB investigators tested the raw water pump at the Cummins Marine laboratory in Charleston, South Carolina. The pump is a Sherwood Pump, Model M71-01-90 as manufactured by Hypo, 375 Fifth Avenue NW, New Brighton, Minnesota. As predicted originally when this matter emerged, any theory that this gap in the raw water pump would have resulted in an inflow of water into the bilge was discredited. The pump was unable to retain suction, in that the supply water level of the water entering the pump would have been below the centerline of the pump, and suction would not have been maintained. Moreover, under these conditions, if no water was flowing through the pump, the pump's impeller would have been destroyed, and the engine would have overheated after just four minutes, resulting in either the shutting down of the engine or melting of the exhaust bellows. The resultant engine noise, exhaust, and odor would have experienced a noticeable change, which was not observed by any of the passengers or master of the vessel. After the temperature gauge demonstrated the overheating, the vessel's power source would have failed, and the engine would have seized. The test demonstrated that, if this were the case, within four minutes, the maximum amount of water in the bilge, based upon the maximum leak rate, would have been between .8 and 1.2 gallons, a negligible amount of additional weight displacement on a 15,300 pound vessel. Accordingly, the idea of a gap in the raw water pump contributing, in any manner, to the capsizing of the vessel should receive no further consideration by the NTSB.

Analysis

At the beginning of this analysis, it is important to note that, in all respects, Shoreline Cruise, Inc. complied with New York State requirements relating to the vessel. The boat was inspected each year, beginning in 1979, and had been inspected, prior to this incident, on May 20, 2005. Pursuant to § 63 of the New York Navigation Law, a New York State inspector may only issue a certificate of inspection if the inspector is "satisfied that a public vessel is in all respects safe and conforms to the requirement of this chapter."¹³ State inspectors had issued the required certificate of inspection to the *Ethan Allen* every year since 1979, including 2005. As noted by the NTSB Marine Accident Factual Report, the vessel carried the appropriate amount of both

¹³ N.Y. Nav. Law § 63, Certificate of Inspection.

adult and child personal flotation devices, fire extinguishers, and ring buoys. This safety equipment was appropriately stored and clearly marked. Moreover, the vessel was routinely maintained, with a staff devoted specifically to this task. Each morning, including the morning in question, masters would check the vessel's fluid levels and bilge status. The company's maintenance personnel would also verify that the fluid levels and bilge status were appropriate.¹⁴ Although the vessel was relatively old, the company routinely replaced older parts with new ones, as needed.

From a safety track record perspective, Shoreline Cruise, Inc., throughout its entire history, has never suffered from any safety citation or complaint. In this regard, the boats operated by the company have taken more than 20,000 trips in 27 years without incident. Both the present and former masters and captains of the *Ethan Allen* were interviewed by law enforcement personnel. Each one confirmed the fact that the *Ethan Allen* was a stable running vessel and had never given any of these masters cause to believe that the boat was dangerous or imbalanced, even with the same or similar loads as the day in question.¹⁵ Certainly, even though the vessel had been out numerous times with the same or similar loads in far windier conditions than those of October 2, 2005, the boat had never had a "close call" or indicated in any way that it could capsize. In short, the owners and operators of the *Ethan Allen* had absolutely no reason whatsoever to believe that the boat could capsize absent exceptional conditions and, to this day, are convinced that only extraordinary wakes such as that experienced by Master Paris on the day of the accident could cause such a mishap.

Although the certificate of inspection called for a crew member to travel on the vessel, the purpose of the crew member: tending to the passengers, was satisfied with the acknowledgement by the Tour Director, Carol Charlton, that she would attend to her clients; thus avoiding the need for Hugh Quirk to board the vessel for this purpose. Certainly, no reasonable expectation of the performance of a crew member would include that he or she could somehow prevent the boat from capsizing. Thus, even if the Board believed that the crew member requirement was not satisfied by the presence of Ms. Charlton, it could hardly determine that the absence of such a crew member had any impact whatsoever on the cause of the vessel's capsizing. Moreover, although Shoreline still would have been in compliance with the terms of the permit if an additional crew member was on board the *Ethan Allen*, the presence of an additional body would have served only to exacerbate the problem, described below, by adding an additional quantum to the weight of the passengers.

Moreover, as far as Master Paris is concerned, this experienced master, as he represented in his statement to law enforcement authorities, piloted the craft precisely as he had done since 1979. Once confronted with unexpected wakes, Master Paris valiantly attempted to turn the vessel into the wakes. Nevertheless, unlike the captain of the smaller, personal vessel who encountered the

¹⁴ See statement of Theordore Beaudet, WCSO report.

¹⁵ As noted by Master Mark Olton to the *Detroit News* on October 6, 2005, who did not work for Shoreline at the time of the interviews: "They are very well handling boats. They are extremely seaworthy. I took them out in some pretty bad weather and I never had a problem." William Huus, another former captain, told the newspaper service that "I carried hours and hours on that boat and she was, I thought, a very safe boat." *Associated Press* (Oct. 3, 2005). Nikki Rose, whose father drove the boat for several years, also stated that there never was an indication that the boat had any problem. *Associated Press* (Oct. 6, 2005).

5 ½ to 6 foot wakes of the *Mohican* straight on minutes after the *Ethan Allen* was swamped, Paris was unable to navigate through the wakes as they struck the vessel from astern at a greater rate of speed than the *Ethan Allen* was traveling, causing the vessel to capsize. Immediately after the incident, he informed law enforcement personnel that the cause of the mishap was the *Mohican*'s wakes. Moreover, it was determined, both through observations of law enforcement authorities, as well as post accident testing and investigation, that he had not consumed any amount of alcohol that would have in any way contributed to this accident.¹⁶

In 1989, seeking to improve the comfort of the passengers of its tour boats, Shoreline engaged Scarano Boat Builders, Inc. to remove the canvas tops and replace them with a sturdier, more weather-resistant wood and fiberglass top, with windows that could be opened and closed depending upon the weather conditions. Each of the vessels was then outfitted with the improved top --- the *Ethan Allen* during the winter of 1989/1990, the *deChamplain* in 1990/1991 and the *Algonquin* in 1991/1992. Although New York State regulations apparently did not require notification regarding the modification, Quirk cannot recall whether he specifically notified the State Parks and Recreation Department, but believes that he likely did. In any event, the boat was continually inspected by the Department, on a yearly basis, at which times the modification was clearly obvious. Since the replacement of the tops, the boats conducted thousands of tours on Lake George, using the same route, in weather conditions far more difficult than those on the day in question, all without incident. Accordingly, it does not appear that the modification to the *Ethan Allen* sixteen years prior to the accident had any causal connection to the incident whatsoever.

Stability of the Boat and Weight of the Passengers. According to the NTSB Factual report, in September of 1978, the Coast Guard identified, as one of the most important safety considerations, the maximum person capacity determination. As stated by the report: "[t]his was the one variable constantly involved in boating accidents where improper loading was a contributory cause. Because persons in a boat can move about changing the stability of the boat, the number of persons that the boat can safely carry was the most critical item of information." With this in mind, the evidence is clear that, prior to departing in the *Ethan Allen* on the day of the incident, Master Paris carefully counted the passengers¹⁷ and determined that he had reached a number just short of¹⁸ the 50 person total capacity for which the boat was certified: 48 passengers plus 2 crew members. Thus, there is no question whatsoever that the *Ethan Allen* was within its maximum load capacity, by passenger count, at the time that it disembarked from the dock.

¹⁶ No law enforcement detected any indication whatsoever of alcohol use, although all looked for it. The Sheriff himself came within six inches of the Master's face. See WCSO report. Two days later, at the request of the Safety Board, the Master voluntarily submitted blood and urine samples. The blood sample was deemed negative for illegal drugs. Although ethyl glucosomide, a product of alcohol metabolism, was found in his urine specimen, Paris had informed investigators that he had a glass of wine with his dinner the evening before the accident, which would be consistent with the detection of this substance.

¹⁷ See footnote 24, below.

¹⁸ The passenger count was 47 -- even assuming Carol Charlton is counted as a passenger, instead of a crew member.

The critical issue here, as identified by the NTSB in its factual report, is the basis of New York State's determination and certification of the maximum passenger limit of the vessel. As noted by the NTSB Factual Report, the classification of boats operating entirely within state waters is the purview of the states. In this regard, the New York Office of Parks, Recreation and Historic Preservation has the authority to promulgate its own rules and regulations relating to navigation safety and, as set forth above, state inspectors are charged with making sure that a vessel meets those safety regulations and is safe, in all respects, before issuing a certificate of inspection to the vessel's owner. In this particular case, based upon the reports, it appears that, as is consistent with its normal operation, the State of New York based its passenger count certification upon a Coast Guard analysis dating back to the 1960's. At that time, as well as subsequently,¹⁹ maximum capacity level was based on an average passenger weight of 140 pounds. In fact, as set forth in § 178.330, Simplified Stability Test, as contained in 46 CFR § 178 – *Intact Stability and Seaworthiness*, the weight of one person is considered to be 63.5 kilograms (140 pounds) if the vessel operates exclusively on protected waters. Consequently, based upon this antiquated data, the State of New York, premised upon Coast Guard regulations, certified the *Ethan Allen* to carry up to 50 people.

Shoreline, complying with the terms of its certificate of inspection, naturally assumed that, as long as it complied with these requirements, the *Ethan Allen* was safe in all respects in that, as the New York Navigation Laws set forth above demonstrate, the state inspectors are not supposed to issue the certificate unless and until they determine that the vessel complies with New York's regulations and is safe in all respects. Adding to its compliance with the New York State certificate, the fact that Shoreline never had reason to question the passenger capacity limitations of the boat, Shoreline had absolutely no reason to believe that any issues existed either with the stability of the boat or the weight of the passengers. Little did it know that, in certifying the boat as appropriate for the passenger count to which Shoreline had strictly adhered, the State of New York (as well as the Coast Guard) had failed to update its data to the heavier American population and adjust its passenger limitations accordingly. Thus, it was not until after the incident occurred and a review of the NTSB Factual Report, that Shoreline learned that the actual weight of these passengers (and apparently now the U.S. population in general) averaged approximately 177.5 pounds, almost 40 pounds heavier, per person, than the assumed per person weight. In light of the fact that, even with the certified passenger weight, based upon 140 pound average of 6720 pounds, a nearly identical vessel failed the simplified stability test performed by the NTSB on the day following the incident, the additional weight of the actual passengers, averaging 177.5 pounds for a total weight of 8522 pounds, would only have exacerbated the issue.

The Wakes of the Mohican. Notwithstanding the antiquated standards employed by the State and Coast Guard, the vessel had traveled up and down Lake George with full capacity for years without incident. In light of the fact that October 2, 2005 was a picture perfect day, with wind so minimal that sail boats on the lake were unable to fill their sails and lay dormant on the waters of Lake George, it obviously required an extraordinary event to cause the vessel to capsize. In that regard, the only explanation that makes any logical sense is the explanation provided

¹⁹ It appears that the weight characterization was also established in connection with a Coast Guard rule change in 1978.

immediately by Master Paris: “stray waves from the wake that was produced by the *Mohican*.”²⁰ Although certain passengers and observers did not notice errant wakes striking the *Ethan Allen*, several passengers noted several waves striking the boat, just as the boat began rocking and passengers fell from their seats. Other passengers noticed Master Paris “frantically” attempting to operate the steering wheel.²¹ The logical explanation for this observation is consistent with Captain Paris’ immediate description of the event occurring immediately prior to the capsizing. This conclusion is buttressed by the fact that at least one family encountered the *Mohican* traveling north at a high rate of speed, creating enormous wakes, just north of the accident scene. Several other witnesses also either witnessed or experienced “rogue” wave activity around the time that the *Ethan Allen* capsized²². Another independent observer, from shore, saw the waves of a “large tour boat,” which had passed the *Ethan Allen* three or four minutes earlier, strike the right (starboard) side of the *Ethan Allen* as a series of waves continued to hit the side of the boat as it tipped over²³. These descriptions are consistent with the immediate explanation provided by the Master: the person in the best position to see and experience the cause of the incident.

²⁰ Several days following the incident, on October 9, investigators from both the NTSB as well as the Warren County Sheriff’s Department took a cruise on the *Mohican* under circumstances entirely dissimilar from those occurring on the afternoon of October 2, 2005, and, Shoreline believes, using a route that differed from the path of the *Mohican* the day that the *Ethan Allen* capsized. Moreover, on October 10, 2005, a group of investigators from the NTSB and the Warren County Sheriff’s Department took a Warren County Sheriff’s Department boat, vessel 583, a vessel with no similarity whatsoever to the *Mohican*, on the lake to observe the reaction of the sister vessel to the *Ethan Allen*, the *deChamplain*, to the wake of the Warren County Sheriff’s Department vessel. Again, this test was enacted under circumstances and with vessels that had very little resemblance to the circumstances surrounding the events of October 2. Unfortunately, although Matthew Quirk had requested the NTSB to reconstruct the accident using the *Mohican* and the *deChamplain* under conditions similar to those on the afternoon of the accident, the methods of testing used on October 9 and 10 by both the NTSB and the Warren County Sheriff’s Department were of little relevance for the investigation into the cause of the accident.

²¹ See statement of passenger Eunice Stevens. WCSO report.

²² In an interview of Elaine Morton by the Warren County Sheriff’s Department, she noted that, at approximately 3:00 p.m., she was at an unknown location north of Cramer Point when she encountered what she described as rogue wave activity. She said that the waves were so unusual that she called her boyfriend to observe them, and that the first wave was very tall and white capped, and followed by two consecutive waves. This “three wave” activity coincides with the description of the waves, as reported in the *Detroit Free Press*, January 17, 2006, by passenger Ted Milek, who stated as follows: “all of a sudden, there were three waves that came, about 5 or 6 feet apart. Sort of swells – about 20 inches.” Milek noted that, at that time, the boat started rocking, people slid out of their seats, and the boat capsized. From a location standpoint, Morton’s description also coincides with that of John Montana, who stated that, when he passed the *Mohican* at Depe Dene, about ½ mile north of Cramer Point, the *Mohican* was traveling at a high rate of speed, and produced swells that were about 5 ½ to 6 feet tall, and were about 14 feet apart. Montana noted that he had to turn his vessel into the waves but that his bow dipped three times, coinciding with the amount of waves witnessed by both Milek and Morton. Angela Montana, John Montana’s wife, confirmed her husband’s account of the incident. Kara Riley, who was working at the Briar Dell Motel in Lake George, noted that the water was very calm all day, and that, at about three in the afternoon, she and her husband noticed that the water became very rough and the boats on the dock began to hit each other. Although she thought that one of the Lake George steam boats was about a mile and a half away, and didn’t cause the wake, she described the wake as very large and unusual. See statements of Elaine Morton, John Montana, Angela Montana and Kara Riley. WCSO report.

²³ See statement of Ruthann Suter. WCSO report.

Conclusions

Shoreline Cruise, Inc. believes that the evidence uncovered in the investigation of this matter demonstrates the following: Based upon antiquated and presently inapplicable weight determinations originally set forth by the Coast Guard, the *Ethan Allen* was certified for a total of 50 people to safely travel on waterways. When the vessel was purchased by Shoreline, the State of New York, which obtained jurisdiction over the vessel, having no mechanism to verify the Coast Guard's assessment, simply adopted the certification for 50 people. For years, the State annually issued a certificate of inspection, confirming to Shoreline and the public that the vessel complied with New York State regulations and was safe. The experience of Shoreline, transporting thousands of passengers on its tour boats over 26 years, was such that the company had no reason whatsoever to question the certification, especially given the incident-free performance history of the *Ethan Allen* and its sister boats. Nevertheless, the growing weight of the American population steadily increased, rendering the data which led to the original certification to become obsolete and leading to greater latent instability in the balance of the vessel, a condition which had never manifested prior to the accident.

On the day in question, Shoreline was extremely careful to make sure that the amount of passengers did not exceed the amount permitted on the certificate of inspection.²⁴ Traveling from the dock on a clear, calm day, the boat traveled without incident until it was struck, on the starboard side, by rogue wakes from a much larger vessel, most likely the *Mohican*. When the wakes struck the starboard side of the vessel, the action of the wakes knocked some of the passengers from their seats, causing the vessel to list further to port. This resulted in the boat rolling further to port and capsizing within seconds. Boats do not simply capsize on clear, calm days, particularly when the vessel has traveled several times per day, with the same captain, for 23 years. Obviously, some unusual event "tripped" the *Ethan Allen* on the day in question, causing it to roll in the water. The only logical explanation, and one that is supported by the evidence, is that the wakes of another vessel caused the mishap, by striking it on the side, causing passengers to fall, and resulting in the vessel capsizing.²⁵

Safety Recommendations

Based upon the factual analysis and conclusions, Shoreline Cruise, Inc. offers the following safety recommendations:

1. The Coast Guard should revise its regulations and its weight and balance standards to calculate passenger capacity for passenger vessels on a statistically representative average passenger weight standard that is periodically (every three years) updated.

²⁴ Two sisters, Emmy Lu Payne and Jacalyn Hein, who stayed on shore, noted that Master Paris counted the passenger heads carefully and announced that the boat was full. See statements of Emmy Lu Payne and Jacalyn Hein, WCSO report.


²⁵ While the accident likely would not have occurred but for the State's antiquated passenger weight standards, it is also clear that given the vessel's long sterling safety record and complete lack of any other contributing cause, the *Ethan Allen* would not have capsized but for the large waves striking her from astern.

2. The State of New York (as well as its sister states) should require that a simplified stability test be conducted by the New York State Office of Parks, Recreation and Historic Preservation periodically (every five years) on each vessel that transports more than 10 passengers.
3. Greater care should be taken to make sure that vessel inspectors are qualified to carefully inspect vessels before issuing certificates of inspection, by requiring minimum education requirements and an apprentice program before an inspector may certify a vehicle.
4. On-water boating and navigation rules should be further scrutinized, including those pertaining to vessel wakes and speed, as well as radio and other audio protocols.
5. No vessel generating a wake in excess of two (2) feet (as measured from trough to wave top) should be permitted to operate within 50 feet of another vessel of any type, whether underway or stationary, except in designated areas of the Lake.
6. Stricter on-water enforcement of these rules, regulations and protocols should commence immediately with severe penalties imposed for repeat violations.

Dated: June 8, 2006

SHORELINE CRUISE, INC.

By:


Sean Quirk, President



State of New York
Office of Parks, Recreation, and Historic Preservation
Bureau of Marine and Recreational Vehicles

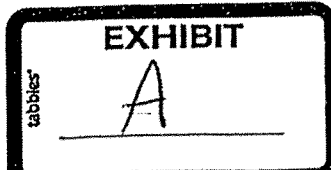
Certificate of Inspection

Registration or Doc. No. NY1267FP		Name of Vessel ETHAN ALLEN		Owner's Name and Address Shoreline Cruises, Inc. 4 Kurosaka Lane Lake George NY 12845													
Hull Identification No. (HIN) NA		Type of Service Tour/Dinner_Cruise															
Vessel Manufacturer DYER		Year	Hull Material 1966 FIBERGLASS		Hull Color(s) WHITE	Length 38	Beam 12										
Propulsion Data Inboard			Engine Manufacturer LATHROP		Engines 1	Horsepower 110	Displacement(tons) 5										
<p>When in operation this vessel must be manned by the following personnel:</p> <p> <u>0</u> Master <u>0</u> Engineer <u>1</u> Crew <u>1</u> Joint Pilot & Engineer Joint Pilot & Engineer (Water Skiing Only) </p> <p>In addition, this vessel may carry <u>48</u> passengers for a total person capacity of <u>50</u></p>																	
<p>The following safety equipment shall be carried by this vessel:</p> <table style="width: 100%;"> <tr> <td style="width: 50%;">Life Preservers (type I PFD) Adult: <u>50</u></td> <td style="width: 50%;">Portable Fire Extinguishers: <u>2</u></td> </tr> <tr> <td>Life Preservers (type I PFD) Child: <u>5</u></td> <td>(Type/Size B1 or UL5 minimum) <u>No</u></td> </tr> <tr> <td>Ring Buoy (Type IV throwable device): <u>1</u></td> <td>Fixed Fire Extinguishing System: <u>No</u></td> </tr> <tr> <td>(Cushion may be substituted on boats less than 26ft) <u>Yes</u></td> <td>(Inboard engine spaces) <u>No</u></td> </tr> <tr> <td>Visual Distress Signals: <u> </u></td> <td>Fire Pump: <u> </u></td> </tr> </table>								Life Preservers (type I PFD) Adult: <u>50</u>	Portable Fire Extinguishers: <u>2</u>	Life Preservers (type I PFD) Child: <u>5</u>	(Type/Size B1 or UL5 minimum) <u>No</u>	Ring Buoy (Type IV throwable device): <u>1</u>	Fixed Fire Extinguishing System: <u>No</u>	(Cushion may be substituted on boats less than 26ft) <u>Yes</u>	(Inboard engine spaces) <u>No</u>	Visual Distress Signals: <u> </u>	Fire Pump: <u> </u>
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Visual Distress Signals: <u> </u>	Fire Pump: <u> </u>																
<p>The following endorsements, exceptions, or additional requirements shall apply to this vessel:</p> 																	

The above identified vessel, having been inspected on 19-May-05 is certified by the undersigned Marine Inspector to be in compliance with the provisions of the New York State Navigation Law and is approved for use as a Public Vessel upon the waters of the State of New York. This certificate shall expire on the last day of July 2006

 Director, Marine and Recreational Vehicles

 Marine Inspector



New York State Office of Parks, Recreation & Historic Preservation

Marine Services Unit

Empire State Plaza
Albany, NY 12238-0001

Phone: 518-474-0445

Fax: 518-408-1030

PUBLIC VESSEL INSPECTION REPORT

OPS413/04

Registration No. NY1267FP	Vessel Name ETHAN ALLEN	Hull Identification No. (HIN) NA	Owner's Name and Address Shoreline Cruises, Inc. James Quirk 4 Kurosaka La Lake George NY 12845 Phone # 5188884644		
Vessel Manufacturer DYER	Year Built 1988	Length 38	Hull Material FIBERGLASS		
Propulsion Type Inboard	Fuel Type DSL	Displacement 5	Color WHITE	Primary Service Type Lun/Dinner	Vessel Inspection Fee Cruis \$20.00

Master 0 Engineer 0 Joint P&E 1 Crew 1 Passengers 48 Total Person Capacity 50

INSPECTION CHECKLIST		S	U	S	U	S	U
1. Anchor and Cable				11. Equipment Marked		20. Ventilation Ducts	
2. Horn				12. Seating		21. Ventilation Exhaust Blower	
3. Bell				13. Navigation Lights		22. Electrical System/Wiring	
4. Adult PFD's				14. Hull		23. Battery Secured & Covered	
5. Child PFD's				15. Engine		24. Bilge Pump & System	
6. Type IV PFD				16. Backfire Flame Arrestor		25. Bilge	
7. Fire Extinguishers - Portable				17. Engine Controls & Steering		26. Registration Certificate	
8. Fire Extinguishers - Installed				18. Fuel Tanks		27. Registration No. & "PV"	
9. Fire Pump and Hose				19. Fuel Lines & Fittings		28. Log Book/Station Bill	
10. Distress Equipment	4/06						

ENDORSEMENTS/DEFICIENCIES

RAW WATER LINE IN
CHAFED AT FWD ENGINE
MOUNT - Replace Hose
OR PLACE CHAFING
MATERIAL ON HOSE.

I certify that the above vessel was inspected on the date below and any deficiencies noted were found to exist. I understand that prior to operation as a Public Vessel all deficiencies are to be corrected to the satisfaction of the inspector, as explained at the time of inspection. I also understand that any person(s), having charge, command or control of a vessel which carries more passengers than stated on the vessel's Certificate of Inspection, or neglects to carry the required equipment is guilty of a misdemeanor.

3-20-05 [Redacted]
Date Owner or his/her representative

☒ The above vessel was inspected and found to comply with the Public Vessel section of the New York State Navigation Law. A temporary permit is granted for the operation as a Public Vessel on the navigable waters of New York State for a period of 60 days from this date.

☐ A temporary permit is not granted at this time. See reverse side.

5/20/05 [Redacted]
Date Inspector

SHORELINE CRUISES, INC.
2 KUROSAKA LANE
LAKE GEORGE, NY 12845
518-668-47644

March 20, 2006

Captain Morgan J. Turrell
NATIONAL TRANSPORTATION SAFETY BOARD
Office of Marine Safety
490 L'Enfant Plaza East S.W.
Washington, DC 20594-2000

RE: Diagram of Travel Routes of PV Mohican and PV Ethan Allen on October 2, 2005

Dear Morgan,

The enclosed diagram is a free-hand drawing with as much attention to scale and detail as possible. To help visualize the relative positions of the Ethan Allen and Mohican, I have placed the frame number corresponding to the location of the image with the time of exposure on the diagram.

I believe the times are off by approximately one hour. In other words, instead of departing at 1:39 the time was really 2:39 p.m. You have to add one hour to the time to make sense of the Mohican and Ethan Allen departures as shown on the Channel 9 monitor. Since all images taken by Steve Gibbon were from the bow of the Mohican it appears that many images were taken forward at great distances and the more critical ones taken from port and starboard sides with possibly a small number of images to the stern.

There were a few frames not placed on the diagram. The exact location of the image could not be identified.

There are two prints of which I can identify the images and it appears the Mohican is abreast of these two points. The first point is the mansion belonging to Mr. Koncikowski (photo 7181). The second photo is Cannon Point (The Antlers Motel). Again the Mohican appears to be beside the image (photo 7234) thus giving two points approximately 2.57 miles apart. The time interval to go from the mansion to Cannon Point is 8 minutes, according to the time stamps on the photos.

$$\frac{2.57 \text{ miles}}{8 \text{ min}} \left(\frac{60 \text{ min/hr}}{1} \right) = 19.275 \frac{\text{mi}}{\text{hr}}$$

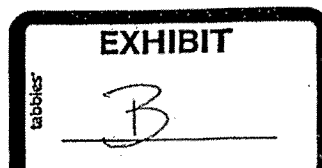
The speed over that distance turns out to be 19.275 miles per hour. This path overlaps Cramer Point where the Ethan Allen Capsized. This projected speed, the large number of passengers on the Mohican, the calmness of the water, the time and the place all add up to a tragedy.

Sincerely,

James D. Quirk

Enc: Diagram

Jimapco Lake George Boaters Map



Scarano Boat Building, Inc.

June 9, 2006

Chairman Mark Rosenker
C/O Morgan Turrell
NTSB
Office of Marine Safety MS-30
490 L'Enfant Plaza East, S.W.
Washington D.C. 20594

RE: ETHAN ALLEN Capsize. Proposed findings of cause

Dear Mr. Turrell:

We appreciate having had the opportunity to participate in the investigation into the cause of the subject matter and appreciate the opportunity to submit our proposed findings of cause and proposed safety recommendations, which we understand will be made part of the public docket.

Only having had the opportunity to review a very rough draft of the Factual Findings, at this stage we are not sure of the factual basis of the investigation as known to NTSB, in this regard our proposed findings, to a large extent, provide a simple summary of the factual issues as far as we have been able to determine them based on information that has become available to us during the investigation.

These findings as a result of the investigations into the ETHAN ALLEN capsize are outlined as follows:

- 1) It is industry practice to trust a vessel's COI (Certificate of Inspection) regarding stability and passenger count.
- 2) The vessel, presumably with no canopy attached, was originally USCG certified for 48 passengers while operating in Connecticut, though analysis shows it only had stability for 41 according to the current USCG standard.
- 3) A pipe frame enclosure was added while the vessel was still operating in Connecticut. The vessel's stability was not reevaluated at that time. The USCG never adjusted the vessel's USCG COI for 48 passengers after that canopy was installed in Connecticut and re-certified the vessel each year thereafter. As a result the vessel

continued to operate and be re-certified with substantially less than the stability required by the USCG standard until it capsized approximately 25 years later.

4) After the vessel was operating in New York in 1989 the owner ordered a new, 15" lower canopy, which reduced the vessel's risk of capsize according to the USCG standard. A summary of the ETHAN ALLEN stability is provided in the November 1, 2005 SBI submitted "Effects of Various Canopy Configurations on Vessel ETHAN ALLEN's Ability to Satisfy USCG Stability Standard" as well as the JMS "PASSENGER VESSEL ETHAN ALLEN STABILITY ANALYSIS" report contracted by the NTSB.

5) The vessel capsized in 2005 from a unique combination of its original lack of stability and the concurrent environmental and operational loading conditions at the time of the capsize incident.

Sincerely:




John Scarano
President
Scarano Boatbuilding Inc

Cummins MerCruiser Diesel
4500 Leeds Avenue #301
Charleston, SC 29405
Phone: 843 740 2700 Fax: 843 745 1616



Capt. Morgan Turrell
Investigator In Charge
National Transportation Safety Board
Office of Marine Safety
490 L'Enfant Plaza, SW
Washington, D.C. 20594

April 20, 2006

Re: Accident No.: DCA06MM001 - Passenger Vessel Ethan Allen Capsizing in Lake George, New York

Dear Mr. Turrell:

Per your request during the technical review held at the NTSB on April 11 herewith are the suggested comments, clarifications and suggested corrections to be included in the final report. As requested the 'Cummins Confidential' has been removed, otherwise there are no other changes from the documents sent on March 31, 2006.

Also, you had asked each member of the Engineering Group to submit input relative to the possible cause(s) of the above accident. Cummins does not feel qualified to make observations on anything other than the raw water pump testing that was undertaken under the leadership of Brian Curtis in Charleston on December 20, 2005.

Our belief, based upon the results of the aforementioned testing, is that the engine and attached raw water pump did not cause or contribute to the capsizing of the vessel. The main factors contributing to this conclusion are:

1. The maximum leakage rate observed through the gap in the pump would be insignificant over the course of a normal day's operation to contribute to any appreciable change in CG or free surface effect from an unconstrained fluid in the bilge that would aid in the tendency of the vessel to capsize.
2. The inability of the raw water pump (with the gap present) to maintain prime and sufficient flow to prevent engine overheating suggests that the gap could not have existed in its observed state for longer than a few moments.
3. The raw water pump centerline was above lake level at all times, even with the vessel fully loaded. Thus there would have been no opportunity for gravity flow from the lake into the bilge via the gap in the pump.

We respectfully request that the above observations are taken into consideration as you produce the final factual document.

Thank you once again for the opportunity to assist the Safety Board with this investigation. Please feel free to contact me should you have any comments or questions.

Sincerely,

A redacted signature, represented by a black rectangular box with a red border.

Derek Walden
Director – Worldwide Customer Support
Cummins MerCruiser Diesel

Copy to: Mr. Brian Curtis,
Engineering Group Chairman,
National Transportation Safety Board

Raw Water Pump Testing

Cummins, Inc., Charleston, SC December 20, 2005

On December 20, 2005, Safety Board investigators tested the raw water pump at the facilities of the engine manufacturer. A pump that was identical to that found on the *Ethan Allen* was used in place of the actual pump to avoid potential damage (thereby preventing further examination), and connected to an identical engine in a test cell. The test cell was configured to replicate the operating conditions on the *Ethan Allen*.

- The raw water temperature was matched to that of the lake at the time of the accident.
- The raw water inlet plumbing was configured to replicate the theoretical raw water inlet restriction calculated from the *Ethan Allen*'s actual plumbing
- The raw water inlet plumbing was configured to allow the adjustment of waterline height in relation to the pump centerline to simulate the unloaded and loaded vessel conditions.
- The engine was coupled to a dynamometer to replicate the theoretical load on the engine at the time of the accident.

The engine with the installed pump was then operated under several test conditions to assess the pump's operational characteristics.

A baseline test concluded that the flow rate of the pump measured 1 gallon per minute for every 100 engine revolutions per minute. A series of tests followed whereby the investigators introduced a gap in the pump housing equivalent to that found on the *Ethan Allen*, i.e, 0.076 inches at it widest point. The following was concluded:

- When starting the engine with the gap introduced to the pump, the pump was unable to establish prime.
- When the gap was introduced the with the engine running, the pump would immediately lose flow then prime.
- When the pump was operated with no water flow, the internal friction of the pump caused the impeller and housing to overheat and emit white smoke.
- With the pump not supplying raw water through engine's cooling system and the engine running at typical operational parameters, the engine would operate a maximum of 4 minutes before it overheated and had to be shut down because of high coolant temperature.
- The maximum leak rate observed out of the gap was 0.2 to 0.3 gallons per minute.

Summary of comments, clarifications and suggested corrections - Cummins, Inc.

Page	Line	Comments, clarifications and suggested corrections for this Report.
12	2	At the time of manufacture, the engine would have been labeled as just "Cummins" not "Cummins MerCruiser Diesel"
17	12	Add Statement: The lower of the 2 hex head bolts attaching the pump attachment flange to the engine gear housing was loose and backed off.
18	Figure 3	Add reference arrow to figure 3 or new figure showing gap between the lower mounting bolt head and pump attachment flange.
18	Figure 3	Reposition the reference arrow pointing to the underside of the pump housing bolt heads that displayed no lockwasher contact. Current position is ambiguous
23;24	12-20;1-8	Section titled "Raw Water Pump" - In this section discussing the testing performed on the raw water pump and engine, errors were found, factual were absent, and some of the wording is confusing. CMD submits the enclosed write up as a suggestion.
24	Between 8 & 9	Needs Section Title ("Stability"?) to denote a change of subject from discussion of raw water pump to vessel stability



June 6, 2006

NTSB Headquarters
490 L'Enfant Plaza, SW
Washington, DC 20594
Mr. Mark V. Rosenker

Dear Mr. Chairman:

We are deeply saddened by the loss of life and the injuries suffered and we offer our condolences to the families and friends that suffer as a result of the October 2, 2005 Ethan Allen accident.

Hypro was only involved with the raw water pump aspect of the Engineering Group's investigation and will limit Party Submission to commenting on the facts related to that portion of the Ethan Allen accident.

The following are Hypro's submissions of facts, analysis, and conclusions relating only to the raw water pump. They are supported by the facts found during the January 10, 2006 laboratory investigation, the December 20, 2005 simulated engine and pump testing, the December 14, 2005 Lake George review of the Ethan Allen, the October 11, 2005 NTSB photographs, and review of the process and control document (attachment 1) for the post manufacture quality control inspection for the pump.

FACTS:

1. The main engine raw water pump was replaced approximately two months before the accident. There were no reported operational problems or leaking involving this pump during the hundreds of cruises of the Ethan Allen during that time period.
2. The accident cruise on October 2, 2005, was the third cruise of the day for the Ethan Allen.
3. Pursuant to the vessel's operating company's policy, at the beginning of each day, masters check the vessel's engine and bilges. Captain Paris stated to NTSB investigators on October 6, 2005 that before the accident cruise he checked the bilge levels and did not observe anything abnormal (Paris transcript, p. 11). Captain Paris also stated that he checked the bilges in the forward compartment and the engine compartment and that both were dry (Paris transcript, p. 34)
4. The master of the accident cruise operated the Ethan Allen on the 10:30 a.m. cruise prior to the accident cruise which commenced at about 1:30 p.m., and he did not report any problems with the engine or the raw water pump.

5. The accident occurred approximately 30 minutes after the Ethan Allen departed from the dock. During these thirty minutes there were no reports of any operational difficulties related to the engine or raw water pump and there were no reports of the pump leaking or any abnormal bilge water levels.

6. Eight days after the accident, on October 10, 2005 the accident investigation revealed that a gap of .076 inches existed at one of the bolts connecting the pump base and the pump impeller housing.

7. The December 20, 2005 NTSB simulated tests of the engine and an exemplar pump with a 0.076" gap proved that engine was unable to operate for more than four minutes without overheating.

8. The maximum leakage rate through the gap in the pump observed during the December 20, 2005 NTSB tests was 0.2 to 0.3 gpm.

9. The pump was located above the waterline when the Ethan Allen was fully loaded. Therefore, when the vessel was sitting at the dock and the engine not running, water could not enter the vessel through the gap on the suction side of the pump.

10. Prior to installation on the vessel and before it left Hypro's manufacturing facility, the raw water pump successfully passed the May 12, 2005 Hypro post manufacturing quality control inspection, which included a pressurized leak test to verify proper assembly procedures and checks for secured bolts.(see attachment 1)

11. The October 11th NTSB photographs of the pump, which were taken prior to removal of the pump from the engine, showed that the pump's identification tag was moved from the original manufactured position.

12. The January 10th NTSB laboratory investigation showed the paper gasket, which is installed between the pump base and wear plate, contained a consistent impression on both the metal wear plate and metal pump base.

ANALYSIS AND CONCLUSIONS:

1. Water could not have entered the vessel through the .076 inch gap when the engine was not running given the fact that the pump was located above the vessel's water line.

2. The NTSB testing demonstrated that The Ethan Allen's engine could not operate for more than 4 minutes without overheating to the point of failure with a gap of .076 inches in the raw water pump. Given this important finding, it is certain that the .076 gap was not present before the vessel capsized and the raw pump could not and did not contribute to the cause of this accident.

3. The bilges of the Ethan Allen were dry before the accident cruise. Captain Paris stated that the bilges of the Ethan Allen were dry before the commencement of the accident cruise. If the bilges were dry, then the raw water pump could not have been leaking prior to the cruise that day. Another Captain, Hugh Quirk, had operated the vessel the morning prior to the accident. He checked the bilges then and found nothing abnormal (H. Quirk, p. 5).

4. At the time of the accident, the trip was about one-half complete, meaning about 30 minutes in length. Assuming the bilges were dry when the vessel left the dock, and assuming

that there was leaking from the raw water pump through the .076 inch gap for 30 minutes, based upon the NTSB test results of a leak rate of 0.2 to 0.3 gpm, only between 6 and 9 gallons of water could have entered the bilge in that 30 minute period which would have not had any affect on the vessel's stability and could not have caused the capsizing.

5. The hypothetical leak could not have occurred for thirty minutes for the engine would have overheated shortly after four minutes of operating time and ultimately seized based upon the NTSB testing.

6. Four minutes of operating the engine with a .076 inch gap would have allowed only about one gallon of water to enter the vessel through the gap. Such a small amount of water would not have any adverse affect on the vessel's stability and could not have contributed to the capsizing. Furthermore, the vessel would not have traveled far from the dock in four minutes before the engine would have failed.

7. The consistent and complete impression of the gasket, which was located between the pump base and the wear plate, was visible both on the pump base and the wear plate. In addition, the aluminum identification tag, which is located between a lockwasher and the pump housing, was crushed from the bolt being properly tightened upon pump assembly. Another bolt location showed a lockwasher imprint on the housing. These facts demonstrate that all of the pump's bolts had been properly tightened at some time before the accident. Further, the pump passed Hypro's in house quality control inspection before it left the control of Hypro. Therefore, sometime after leaving Hypro, the referenced pump housing bolts were manually backed out from the original manufactured position.

8. Potential reasons for the loosening of the bolts and/or removal of the pump housing bolts during boat maintenance prior to accident include, but are not limited to: rubber impeller replacement or an impeller evaluation due to concerns of dry running as a result of temporary material blockage (plastic bag, etc.) to the suction line, rubber impeller replacement or impeller check due to the boat's sea cock not being reopened after repairs, and rubber impeller replacement or check as part of a commercial boat operations periodic maintenance.

SUMMARY CONCLUSION:

There are no facts that support any conclusion other than the bilges were dry before the beginning of the accident trip on October 2, 2005 and that the engine operated properly on that trip. The gap that was observed at the raw water pump flange after the Ethan Allen was raised could not have existed before the capsizing otherwise the engine would have overheated within minutes of the vessel leaving the dock. Further the leakage from the gap, even if present, would have been of such a minimal amount of water that it could not have had any negative affect on the vessel's stability. Therefore, the raw water pump did not play any causal role in the capsizing. The capsizing was due to one or more factors affecting the vessel's stability.

Thank you for the opportunity to assist the NTSB with the investigation.

Respectfully,



Mike Linsdau
Hypro